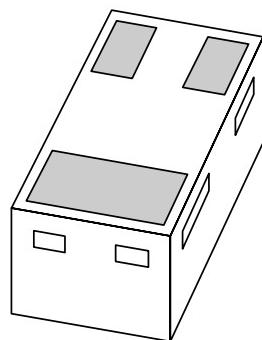


DATA SHEET



PBSS3540M
40 V, 0.5 A
PNP low V_{CEsat} (BISS) transistor

Product specification

2003 Aug 12

40 V, 0.5 A

PNP low V_{CEsat} (BISS) transistor

PBSS3540M

FEATURES

- Low collector-emitter saturation voltage V_{CEsat}
- High collector current capability I_C and I_{CM}
- High efficiency leading to reduced heat generation
- Reduced printed-circuit board requirements.

APPLICATIONS

- Power management:
 - DC-DC converter
 - Supply line switching
 - Battery charger
 - LCD backlighting.
- Peripheral driver:
 - Driver in low supply voltage applications (e.g. lamps and LEDs).
 - Inductive load drivers (e.g. relays, buzzers and motors).

DESCRIPTION

Low V_{CEsat} PNP transistor in a SOT883 leadless ultra small plastic package.

NPN complement: PBSS2540M.

MARKING

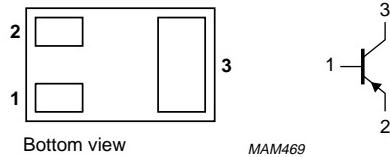
TYPE NUMBER	MARKING CODE
PBSS3540M	DA

QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	UNIT
V_{CEO}	collector-emitter voltage	-40	V
I_C	collector current (DC)	-500	mA
I_{CM}	peak collector current	-1	A
R_{CEsat}	equivalent on-resistance	<700	$m\Omega$

PINNING

PIN	DESCRIPTION
1	base
2	emitter
3	collector



MAM469

Fig.1 Simplified outline (SOT883) and symbol.

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LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V_{CBO}	collector-base voltage	open emitter	–	–40	V
V_{CEO}	collector-emitter voltage	open base	–	–40	V
V_{EBO}	emitter-base voltage	open collector	–	–6	V
I_C	collector current (DC)	notes 1 and 2	–	–500	mA
I_{CM}	peak collector current		–	–1	A
I_{BM}	peak base current		–	–100	mA
P_{tot}	total power dissipation	$T_{amb} \leq 25^\circ\text{C}$; notes 1 and 2	–	250	mW
		$T_{amb} \leq 25^\circ\text{C}$; note 1 and 3	–	430	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		–	150	°C
T_{amb}	operating ambient temperature		–65	+150	°C

Notes

1. Refer to SOT883 standard mounting conditions.
2. Device mounted on an FR4 printed-circuit board, single-sided copper, tinplated, standard footprint, with 60 μm copper strip line.
3. Device mounted on a printed-circuit board, single-sided copper, tinplated, mounting pad for collector 1 cm^2 .

THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th j-a}$	thermal resistance from junction to ambient	in free air; notes 1 and 2	500	K/W
		in free air; notes 1, 3 and 4	290	K/W

Notes

1. Refer to SOT883 standard mounting conditions.
2. Device mounted on an FR4 printed-circuit board, single-sided copper, tinplated, standard footprint, with 60 μm copper strip line.
3. Device mounted on a printed-circuit board, single-sided copper, tinplated, mounting pad for collector 1 cm^2 .
4. Operated under pulsed conditions: duty cycle $\delta \leq 20\%$, pulse width $t_p \leq 30$ ms.

Soldering

Reflow soldering is the only recommended soldering method.

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CHARACTERISTICS

$T_{amb} = 25^\circ\text{C}$ unless otherwise specified.

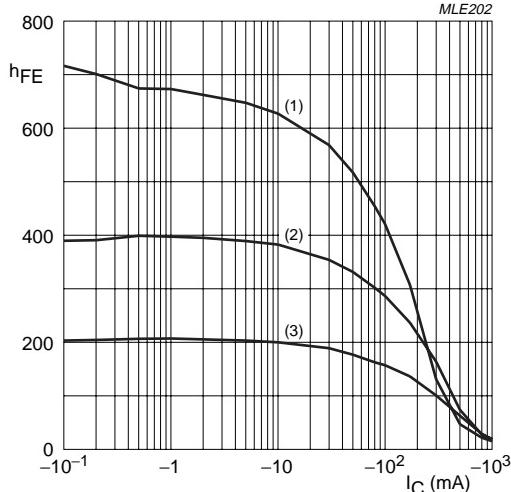
SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
I_{CBO}	collector-base cut-off current	$V_{CB} = -30\text{ V}; I_E = 0$	—	—	-100	nA
		$V_{CB} = -30\text{ V}; I_E = 0; T_j = 150^\circ\text{C}$	—	—	-50	μA
I_{EBO}	emitter-base cut-off current	$V_{EB} = -5\text{ V}; I_C = 0$	—	—	-100	nA
h_{FE}	DC current gain	$V_{CE} = -2\text{ V}; I_C = -10\text{ mA}$	200	—	—	
		$V_{CE} = -2\text{ V}; I_C = -100\text{ mA}; \text{note 1}$	150	—	—	
		$V_{CE} = -2\text{ V}; I_C = -500\text{ mA}; \text{note 1}$	40	—	—	
V_{CEsat}	collector-emitter saturation voltage	$I_C = -10\text{ mA}; I_B = -0.5\text{ mA}$	—	—	-50	mV
		$I_C = -100\text{ mA}; I_B = -5\text{ mA}$	—	—	-130	mV
		$I_C = -200\text{ mA}; I_B = -10\text{ mA}$	—	—	-200	mV
		$I_C = -500\text{ mA}; I_B = -50\text{ mA}; \text{note 1}$	—	—	-350	mV
R_{CEsat}	equivalent on-resistance	$I_C = -500\text{ mA}; I_B = -50\text{ mA}; \text{note 1}$	—	440	<700	$\text{m}\Omega$
V_{BEsat}	base-emitter saturation voltage	$I_C = -500\text{ mA}; I_B = -50\text{ mA}; \text{note 1}$	—	—	-1.2	V
V_{BEon}	base-emitter turn-on voltage	$V_{CE} = -2\text{ V}; I_C = -100\text{ mA}; \text{note 1}$	—	—	-1.1	V
f_T	transition frequency	$I_C = -100\text{ mA}; V_{CE} = -5\text{ V}; f = 100\text{ MHz}$	100	300	—	MHz
C_c	collector capacitance	$V_{CB} = -10\text{ V}; I_E = I_e = 0; f = 1\text{ MHz}$	—	—	10	pF

Note

1. Pulse test: $t_p \leq 300\text{ }\mu\text{s}; \delta \leq 0.02$.

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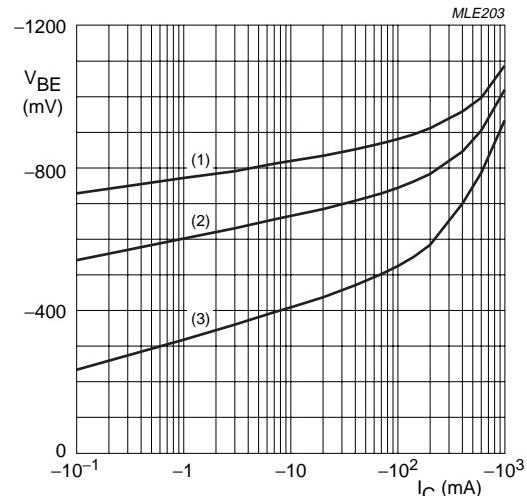
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$V_{CE} = -2$ V.

- (1) $T_{amb} = 150$ °C.
- (2) $T_{amb} = 25$ °C.
- (3) $T_{amb} = -55$ °C.

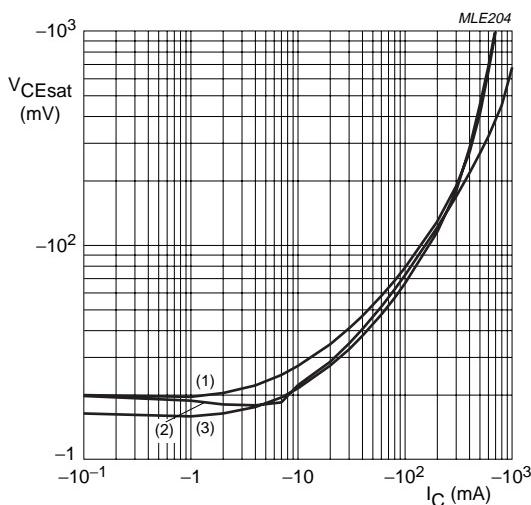
Fig.2 DC current gain as a function of collector current; typical values.



$V_{CE} = -2$ V.

- (1) $T_{amb} = -55$ °C.
- (2) $T_{amb} = 25$ °C.
- (3) $T_{amb} = 150$ °C.

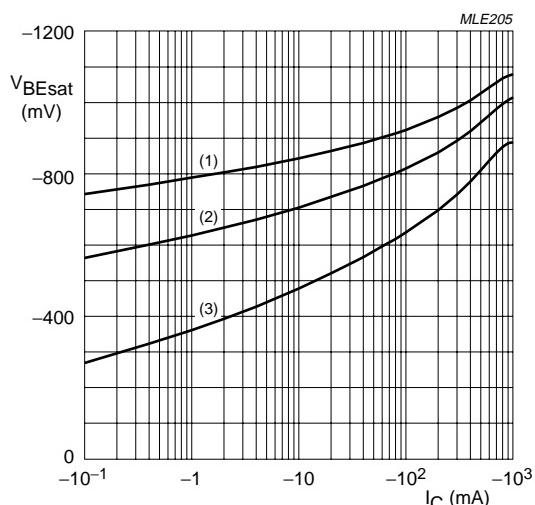
Fig.3 Base-emitter voltage as a function of collector current; typical values.



$I_C/I_B = 20$.

- (1) $T_{amb} = 150$ °C.
- (2) $T_{amb} = 25$ °C.
- (3) $T_{amb} = -55$ °C.

Fig.4 Collector-emitter saturation voltage as a function of collector current; typical values.



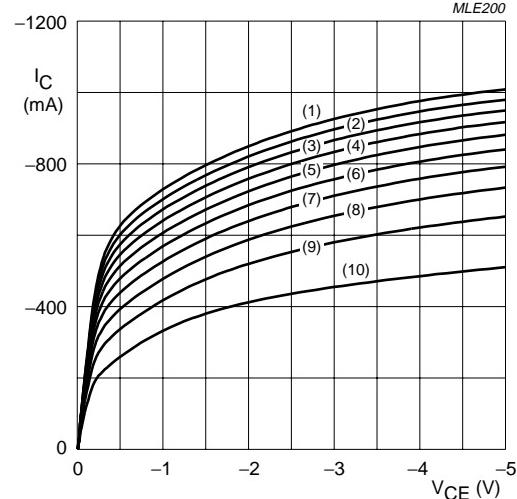
$I_C/I_B = 20$.

- (1) $T_{amb} = 150$ °C.
- (2) $T_{amb} = 25$ °C.
- (3) $T_{amb} = -55$ °C.

Fig.5 Base-emitter saturation voltage as a function of collector current; typical values.

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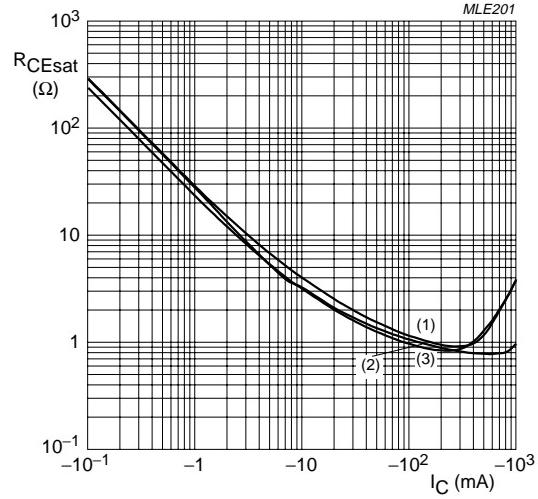
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$T_{amb} = 25^\circ\text{C}$.

- | | | |
|------------------------------|------------------------------|------------------------------|
| (1) $I_B = -40 \text{ mA}$. | (5) $I_B = -24 \text{ mA}$. | (9) $I_B = -8 \text{ mA}$. |
| (2) $I_B = -36 \text{ mA}$. | (6) $I_B = -20 \text{ mA}$. | (10) $I_B = -4 \text{ mA}$. |
| (3) $I_B = -32 \text{ mA}$. | (7) $I_B = -16 \text{ mA}$. | |
| (4) $I_B = -28 \text{ mA}$. | (8) $I_B = -12 \text{ mA}$. | |

Fig.6 Collector current as a function of collector-emitter voltage; typical values.



$I_C/I_B = 20$.

- | |
|-------------------------------------|
| (1) $T_{amb} = 150^\circ\text{C}$. |
| (2) $T_{amb} = 25^\circ\text{C}$. |
| (3) $T_{amb} = -55^\circ\text{C}$. |

Fig.7 Collector-emitter equivalent on-resistance as a function of collector current; typical values.

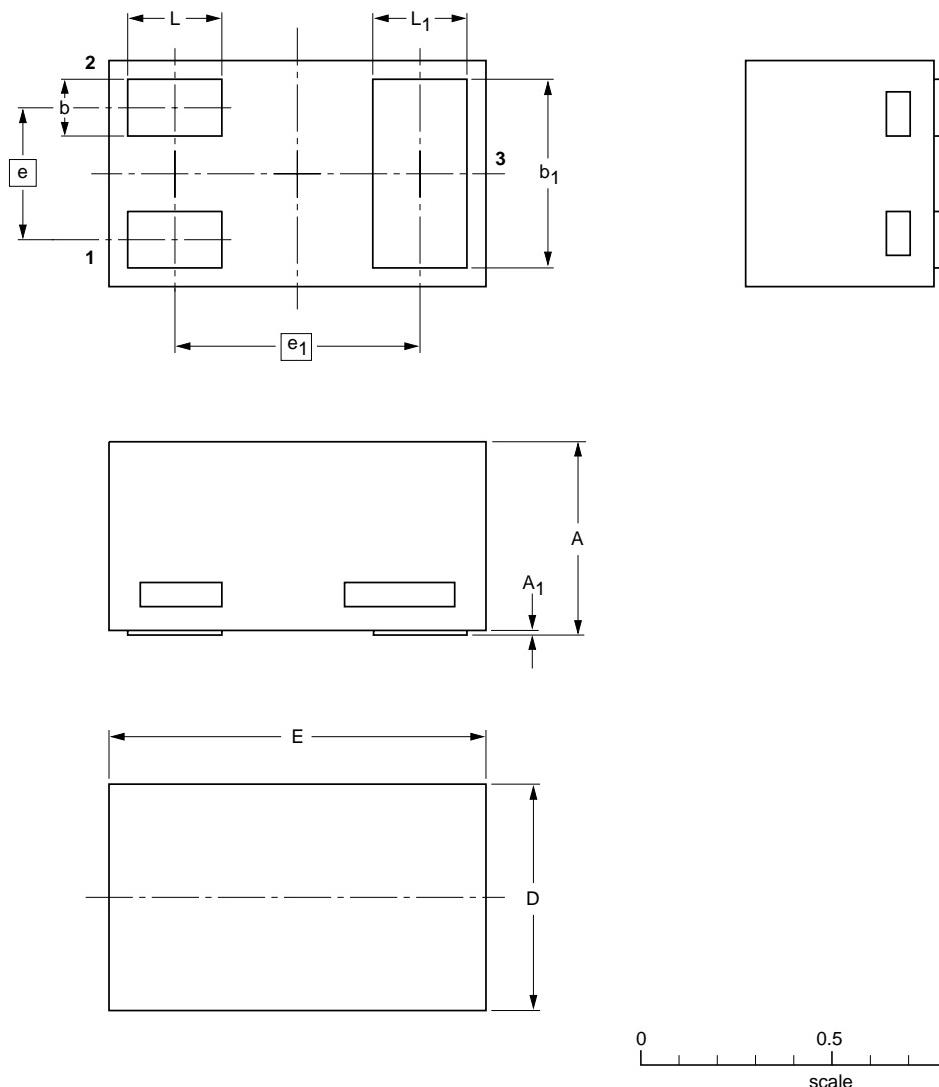
**40 V, 0.5 A
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PACKAGE OUTLINE

Leadless ultra small plastic package; 3 solder lands; body 1.0 x 0.6 x 0.5 mm

SOT883



DIMENSIONS (mm are the original dimensions)

UNIT	A ⁽¹⁾	A ₁ max.	b	b ₁	D	E	e	e ₁	L	L ₁
mm	0.50 0.46	0.03	0.20 0.12	0.55 0.47	0.62 0.55	1.02 0.95	0.35	0.65	0.30 0.22	0.30 0.22

Note

1. Including plating thickness

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA	SC-101		
SOT883						03-02-05 03-04-03

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DATA SHEET STATUS

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